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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/512,095	10/21/2004	Hag-Yong Kim	3254-0124PUS1	9155

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BIRCH STEWART KOLASCH & BIRCH  
PO BOX 747  
FALLS CHURCH, VA 22040-0747

EXAMINER
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AN, SANG WOOK

ART UNIT	PAPER NUMBER
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1732

DATE MAILED: 05/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/512,095

Applicant(s)

KIM ET AL.

Examiner

Sang W. An

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 October 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 10/21/2004.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 1 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 1 describes polymer fibers being spun onto the surface of water or organic solvent in one sentence and then in the following sentence describes the solvent as being water and "inorganic" solvent. Please make the necessary corrections. For the purposes of the art rejections, the examiner has chosen the organic solvent as the applicant's intended solvent.

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

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were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-6 and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al (20020100725) in view of Terry et al (2746839).

Regarding claims 1 and 10, Lee et al teach a process of preparing a continuous filament composed of a nano fiber (par 0008), wherein nano fibers are prepared by spinning one or more polymer (par 0040) spinning dope onto the surface of a collector, has a conductive material (par 0042) with a high voltage applied through nozzles with a high voltage applied (par 0059). Lee et al also teach rolling up the web of fiber using a roller (par 0055). However, Lee et al do not teach spinning the fibers onto the surface of water or organic solvent of a collector where the fibers are pressed, drawn, dried and wound while being pulled by a rotary roller rotating at a constant linear velocity from the location spaced more than 1 cm from one end of a dropping spot.

Nevertheless, Terry et al teach pressing and drawing the fibers through the spinning head (fig 1, **24**), drawing the fibers through a coagulating bath (fig 1, **55**) containing organic solvent (col 6 lines 41-44), drying and winding the fibers by a rotary roller (fig 1, **66,67,72**) rotating at a constant linear velocity from (col 7 lines 23-25). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to use the teachings of Terry et al in Lee et al's electrospinning method in

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order to dissolve out the solvents from the plastic material being spun (col 6 lines 36-40). The distance of the rotary roller to the end of a dropping spot is considered to be a control variable. The examiner notes that discovering the optimum value of a result effective variable involves only routine skill in the art. "In re Boesch," 617F.2d 272,205 USPQ215 (COPPA1980).

Regarding claim 2, Lee et al teach that the conductive material is a metal/aluminum plate (par 0059).

Regarding claims 3 and 4, Lee et al do not teach that the distance from the surface of water or organic solvent contained in the collector to the top surface of the conductive material is 0.01 to 200 nm or 5 to 50 nm. However, the distance from the surface of the solvent to the top surface of the conductive material is a control variable. Examiner notes that discovering the optimum value of a result effective variable involves only routine skill in the art. "In re Boesch," 617F.2d 272,205 USPQ215 (COPA 1980).

Regarding claims 5 and 6, Lee et al do not teach the angles being 0 to 180° or 10 to 90°. However, Terry et al teach the angle of the filament to the roller 66 as being approximately 45° (fig 1). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to use the teachings of Terry et al in Lee et al's electrospinning method in order to remove free liquid (col 7 line 18).

Regarding claim 8, Lee et al teach nano fibers having a diameter less than 1,000 nm (par 0009).

Regarding claim 9, Lee et al teach electrospinning nylon (par 0009).

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4. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al (20020100725) in view of Terry et al (2746839) further in view of Reneker (6520425). Lee et al in view of Terry et al do not teach twisted filament (yarn). However Reneker teach combined nanofibers that are twisted into yarns with a gas vortex (col 12 lines 28-29). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to use the teachings of Reneker in Lee et al's method of electrospinning in order to form twisted yarn that could be woven into a fabric.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sang W. An whose telephone number is (571) 272-1997. The examiner can normally be reached on Mon-Fri 7 AM - 3:30 PM.

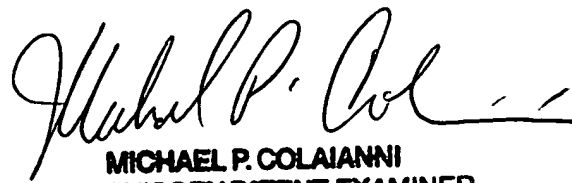
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Colaianni can be reached on (571) 272-1196. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Sang Wook An  
Patent Examiner  
Art Unit 1732  
May 10, 2006

*SAA*

  
**MICHAEL P. COLAIANNI**  
**SUPERVISORY PATENT EXAMINER**